

What is claimed is:

1. A multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, comprising:  
5        a recording track-designating section that designates at least one track for recording, from a plurality of tracks, as desired;  
10      a reproducible track number-determining section that determines a number of tracks that can be reproduced, in response to the designation of the at least one track for recording; and  
15      a reproducing track number-limiting section that limits a number of tracks for reproduction to the number of tracks that can be reproduced, by automatically muting at least predetermined one of tracks designated for reproduction, when the number of tracks designated for reproduction is larger than the number of tracks that can be reproduced.
- 20      2. A multi-track digital recording/reproducing apparatus according to claim 1, including a reproducing track-changing section that is capable of changing any of the tracks designated for reproduction, so long as the number of tracks designated for reproduction is equal to or smaller than the number of tracks that can be reproduced.
- 25      3. A multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, comprising:  
30        a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks;  
35        a plurality of external input terminals that are capable of receiving data from at least one external device;

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- a plurality of external output terminals that are capable of outputting data to at least one external device;
- 5 a plurality of mixer input channels that control characteristics of data inputted thereto and output the data;
- 10 a first selection section that causes the data inputted to said external input terminals to be selectively inputted to at least designated one of said mixer input channels;
- 15 a plurality of mixing buses that each mix data inputted thereto and output the mixed data;
- 20 a second selection section that causes the data outputted from the tracks of said multi-track recorder to be selectively inputted to at least designated one of said mixing buses;
- 25 a third selection section that causes the data outputted from said mixer input channels to be selectively inputted to at least designated one of said mixing buses;
- 30 a fourth selection section that causes the mixed data outputted from each of said mixing buses to be selectively inputted to at least designated one of said external output terminals as data to be outputted therefrom;
- 35 a fifth selection section that causes the mixed data outputted from each of said mixing buses to be selectively inputted to at least designated one of the tracks of said multi-track recorder;
- 40 a display section that displays in text format selection settings of said first selection section for selective input of the data inputted to said external input terminals to the at least designated one of said mixer input channels, and at the same time displays in graphical representation selection settings of said third

- selection section for selective input of the data outputted from said mixer input channels to the at least designated one of said mixing buses and selection settings of said fifth selection section for selective  
5 input of the mixed data from each of said mixing buses to the at least designated one of the tracks in a manner following respective data transfer paths; and  
a selection control section that changes the selection settings of said first, third and fifth  
10 selection sections and selection settings of said second and fourth selection sections in response to user's instructions.
4. A multi-track digital recording/reproducing apparatus according to claim 3, including operating elements that a user operates to give instructions to the apparatus, and wherein said selection control section changes the selection settings of said first selection section according to user's operation of at least one of the operating elements, and at the same time changes a  
20 display in text format of the selection settings of said first selection section on said display section, in accordance with the changes in the selection settings of said first selection section.
5. A multi-track digital recording/reproducing apparatus according to claim 3, including operating elements that a user operates to give instructions to the apparatus, and wherein said selection control section changes the selection settings of said third selection section according to user's operation of at least one of  
25 the operating elements, and at the same time changes a display in graphical representation of the selection settings of said third selection section on said display section, in accordance with the changes in the selection settings of said third selection section.  
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apparatus for recording and reproducing digital audio data by using multiple tracks, comprising:

a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks;

5        a plurality of external output terminals that are capable of outputting data to at least one external device;

10      a plurality of mixer input channels that control characteristics of data inputted thereto and output the data;

      a plurality of mixing buses that each mix data inputted thereto and output the mixed data;

15      a first selection section that causes the data outputted from each of the tracks of said multi-track recorder to be selectively inputted to at least designated one of said mixing buses;

20      a second selection section that causes the data outputted from said mixer input channels to be selectively inputted to at least designated one of said mixing buses;

25      a third selection section that causes the mixed data outputted from each of said mixing buses to be selectively inputted to at least designated one of said external output terminals as data to be outputted therefrom;

30      a fourth selection section that causes the mixed data outputted from each of said mixing buses to be selectively inputted to at least designated one of the tracks of said multi-track recorder;

35      a display section that displays in graphical representation, concerning said mixer input channels, a first setting display showing selection settings of said second selection section for selective input of the data from said mixer input channels to the at least designated

one of said mixing buses, and a second setting display showing selection settings of said fourth selection section for selective input of the mixed data from each of said mixing buses to the at least designated one of  
5 the tracks of said multi-track recorder in an manner following respective data transfer paths; and  
a selection control section that changes the selection settings of said second selection section in response to user's instructions, and at the same time  
10 changes the first setting display displayed on the display section in graphical representation, in accordance with the changes in the selection settings of said second selection section.

7. A multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, comprising:  
15 a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks;  
20 a plurality of external input terminals that are capable of receiving data from at least one external device;  
a plurality of external output terminals that are capable of outputting data to at least one external device;  
25 a plurality of mixer input channels that control characteristics of data inputted thereto and output the data;  
a first selection section that causes the data inputted to said external input terminals to be selectively inputted to at least designated one of said mixer input channels;  
30 a plurality of mixing buses that each mix data inputted thereto and output the mixed data;  
35 a second selection section that causes the data

outputted from said mixer input channels to be selectively inputted to at least designated one of said mixing buses;

5 a plurality of recorder input channels that receive data from respective corresponding specific ones of the tracks of said multi-track recorder, controls characteristics of the data inputted thereto, and outputs the data;

10 a third selection section that causes the data outputted from the plurality of recorder input channels to be selectively inputted to designated ones of said mixing buses;

15 a fourth selection section that causes the mixed data outputted from each of said mixing buses to be selectively inputted to at least designated one of said external output terminals as data to be outputted therefrom;

20 a fifth selection section that causes the mixed data outputted from each of said mixing buses to be selectively inputted to at least designated one of the tracks of said multi-track recorder; and  
25 a selection control section that changes selection settings of said first to fifth selection sections in response to user's instructions.

30 8. A multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, comprising:

35 a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks;

a plurality of external input terminals that are capable of receiving data from at least one external device;

35 a plurality of mixer input channels that control characteristics of data inputted thereto and output the

data;

    a first selection section that causes the data inputted to said external input terminals to be selectively inputted to at least designated one of said 5 mixer input channels;

    a plurality of mixing buses that each mix data inputted thereto and output the mixed data;

    a second selection section that causes the data outputted from each of the tracks of said multi-track 10 recorder to be selectively inputted to at least designated one of said mixing buses;

    a third selection section that causes the data outputted from said mixer input channels to be selectively inputted to at least designated one of said 15 mixing buses;

    a fourth selection section that causes the data outputted from the plurality of mixer input channels or the mixed data outputted from said mixing buses to be selectively inputted to at least designated one of the 20 tracks of said multi-track recorder;

    a display section that displays a first setting display showing selection settings of said first selection section for selective input of the data inputted to said external input terminals to the at least 25 designated one of said mixer input channels, a second setting display showing selection settings of said fourth selection section for selective input of the data from said mixer input channels to the designated least one of the tracks of said multi-track recorder, and an execution 30 button;

    a display changing section that changes contents of the first setting display and contents of the second setting display, according to user's instructions; and 35 a selection control section that changes the selection settings of said first selection section based

on the changed contents of the first setting display, and the selection settings of said fourth selection section based on the changed contents of the second setting display, in response to user's operation of the execution button.

- 5           9. A multi-track digital recording/reproducing method using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks,
- 10          the multi-track digital recording/reproducing method comprising the steps of:
- designating at least one track for recording, from a plurality of tracks, as desired;
- determining a number of tracks that can be reproduced, in response to the designation of the at least one track for recording; and
- 15          limiting a number of tracks for reproduction to the number of tracks that can be reproduced, by automatically muting at least predetermined one of tracks designated for reproduction, when the number of tracks designated for reproduction is larger than the number of tracks that can be reproduced.
- 20          10. A multi-track digital recording/reproducing method using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks, a plurality of external input terminals that are capable of receiving data from at least one external device, a plurality of external output terminals that are capable of outputting data to at least one external device, a plurality of mixer input channels that control characteristics of data inputted thereto and output the data, and a plurality of mixing buses that each mix data
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- inputted thereto and output the mixed data,  
the multi-track digital recording/reproducing method  
comprising the steps of:
- causing the data inputted to the external input
  - 5 terminals to be selectively inputted to at least  
designated one of the mixer input channels;
  - causing the data outputted from the tracks of the  
multi-track recorder to be selectively inputted to at  
least designated one of the mixing buses;
  - 10 causing the data outputted from the mixer input  
channels to be selectively inputted to at least  
designated one of the mixing buses;
  - causing the mixed data outputted from each of the  
mixing buses to be selectively inputted to at least  
15 designated one of the external output terminals as data  
to be outputted therefrom;
  - causing the mixed data outputted from each of the  
mixing buses to be selectively inputted to at least  
designated one of the tracks of the multi-track recorder;
  - 20 displaying in text format selection settings for  
selective input of the data inputted to the external  
input terminals to the at least designated one of the  
mixer input channels, and at the same time displaying in  
graphical representation selection settings for selective  
25 input of the data outputted from the mixer input channels  
to the at least designated one of the mixing buses, and  
selection settings for selective input of the mixed data  
from each of the mixing buses to the at least designated  
one of the tracks of the multi-track recorder, in a  
30 manner following respective data transfer paths; and  
changing the selection settings for selective input  
of the data inputted to the external input terminals to  
the at least designated one of the mixer input channels,  
the selection settings for selective input of the data  
35 outputted from the mixer input channels to the at least

designated one of the mixing buses, the selection settings for selective input of the mixed data from each of the mixing buses to the at least designated one of the tracks of the multi-track recorder, selection settings 5 for selective input of the data outputted from the tracks of the multi-track recorder to the at least designated one of the mixing buses, and selection settings for selective input of the mixed data outputted from each of the mixing buses to the at least designated one of the 10 external output terminals, in response to user's instructions.

11. A multi-track digital recording/reproducing method using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio 15 data by using multiple tracks, the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks, a plurality of external output terminals that are capable of outputting data to at least one external 20 device, a plurality of mixer input channels that control characteristics of data inputted thereto and output the data, and a plurality of mixing buses that each mix data inputted thereto and output the mixed data,

the multi-track digital recording/reproducing method 25 comprising the steps of:

causing the data outputted from each of the tracks of the multi-track recorder to be selectively inputted to at least designated one of the mixing buses;

causing the data outputted from the mixer input 30 channels to be selectively inputted to at least designated one of the mixing buses;

causing the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the external output terminals as data

35 to be outputted therefrom;

causing the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the tracks of the multi-track recorder;

displaying in graphical representation, concerning

- 5 the mixer input channels, a first setting display showing selection settings for selective input of the data from the mixer input channels to the at least designated one of the mixing buses, and a second setting display showing selection settings for selective input of the mixed data

10 from each of the mixing buses to the at least designated one of the tracks, in an manner following respective data transfer paths; and

changing the selection settings for selective input of the data from the mixer input channels to the at least designated one of the mixing buses in response to user's instructions, and at the same time changes the first setting display displayed in graphical representation, in accordance with the changes in the selection settings.

#### 12. A multi-track digital recording/reproducing

- 20 method using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks, a plurality of external input terminals that are capable of receiving data from at least one external device, a plurality of external output terminals that are capable of outputting data to at least one external device, a plurality of mixer input channels that control characteristics of data inputted thereto and output the data, a plurality of mixing buses that each mix data inputted thereto and output the mixed data, and a plurality of recorder input channels that receive data from respective corresponding specific ones of the tracks 30 of the multi-track recorder, controls characteristics of

- the data inputted thereto, and outputs the data,  
the multi-track digital recording/reproducing method  
comprising the steps of:
- causing the data inputted to the external input
  - 5 terminals to be selectively inputted to at least  
designated one of the mixer input channels;
  - causing the data outputted from the mixer input  
channels to be selectively inputted to at least  
designated one of the mixing buses;
  - 10 causing the data outputted from the plurality of  
recorder input channels to be selectively inputted to  
designated ones of the mixing buses;
  - causing the mixed data outputted from each of the  
mixing buses to be selectively inputted to at least  
15 designated one of the external output terminals as data  
to be outputted therefrom;
  - causing the mixed data outputted from each of the  
mixing buses to be selectively inputted to at least  
designated one of the tracks of the multi-track recorder;
  - 20 and
  - changing, in response to user's instructions,  
selection sections for selective input of the data  
inputted to the external input terminals to the at least  
designated one of the mixer input channels, selection  
sections for selective input of the data outputted from  
25 the mixer input channels to the at least designated one  
of the mixing buses, selection sections for selective  
input of the data outputted from the plurality of  
recorder input channels to the designated ones of the  
mixing buses, selection sections for selective input of  
30 the mixed data outputted from each of the mixing buses to  
the at least designated one of the external output  
terminals, and selection sections for selective input of  
the mixed data outputted from each of the mixing buses to  
35 the at least designated one of the tracks of the multi-

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track recorder.

13. A multi-track digital recording/reproducing method using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks, a plurality of external input terminals that are capable of receiving data from at least one external device, a plurality of mixer input channels that control characteristics of data inputted thereto and output the data, and a plurality of mixing buses that each mix data inputted thereto and output the mixed data,

14. the multi-track digital recording/reproducing method comprising the steps of:

15. causing the data inputted to the external input terminals to be selectively inputted to at least designated one of the mixer input channels;

16. causing the data outputted from each of the tracks of the multi-track recorder to be selectively inputted to at least designated one of the mixing buses;

17. causing the data outputted from the mixer input channels to be selectively inputted to at least designated one of the mixing buses;

18. causing the data outputted from the plurality of mixer input channels or the mixed data outputted from the mixing buses to be selectively inputted to at least designated one of the tracks of the multi-track recorder;

19. displaying a first setting display showing selection settings for selective input of the data inputted to the external input terminals to the at least designated one of the mixer input channels, a second setting display showing selection settings for selective input of the data from the mixer input channels to the designated

20. least one of the tracks of the multi-track recorder, and

an execution button;

changing contents of the first setting display and contents of the second setting display, according to user's instructions; and

- 5        changing the selection settings for the selective input of the data inputted to the external input terminals to the at least designated one of the mixer input channels based on the changed contents of the first setting display, and the selection settings for the
- 10      selective input of the data from the mixer input channels to the designated least one of the tracks of the multi-track recorder based on the changed contents of the second setting display, in response to user's operation of the execution button.
- 15      14. A recording/reproducing program executed by a computer, the program using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, the program comprising:
  - 20      a recording track-designating module that designates at least one track for recording, from a plurality of tracks, as desired;
  - 25      a reproducible track number-determining module that determines a number of tracks that can be reproduced, in response to the designation of the at least one track for recording; and
  - 30      a reproducing track number-limiting module that limits a number of tracks for reproduction to the number of tracks that can be reproduced, by automatically muting at least predetermined one of tracks designated for reproduction, when the number of tracks designated for reproduction is larger than the number of tracks that can be reproduced.
- 35      15. A recording/reproducing program executed by a computer, the program using a multi-track digital

- recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data
- 5     on a plurality of tracks, a plurality of external input terminals that are capable of receiving data from at least one external device, a plurality of external output terminals that are capable of outputting data to at least one external device, a plurality of mixer input channels that control characteristics of data inputted thereto and output the data, and a plurality of mixing buses that each mix data inputted thereto and output the mixed data, the program comprising:
- 10        a first selection module that causes the data inputted to the external input terminals to be selectively inputted to at least designated one of the mixer input channels;
- 15        a second selection module that causes the data outputted from the tracks of the multi-track recorder to be selectively inputted to at least designated one of the mixing buses;
- 20        a third selection module that causes the data outputted from the mixer input channels to be selectively inputted to at least designated one of the mixing buses;
- 25        a fourth selection module that causes the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the external output terminals as data to be outputted therefrom;
- 30        a fifth selection module that causes the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the tracks of the multi-track recorder;
- 35        a display module that displays in text format selection settings by the first selection module for selective input of the data inputted to the external

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- input terminals to the at least designated one of the mixer input channels, and at the same time displays in graphical representation selection settings by the third selection module for selective input of the data
- 5       outputted from the mixer input channels to the at least designated one of the mixing buses, and selection settings by the fifth selection module for selective input of the mixed data from each of the mixing buses to the at least designated one of the tracks, in a manner
- 10      following respective data transfer paths; and
- 15      a selection settings-changing module that changes the selection settings by said first, third and fifth selection modules, and selection settings by said second and fourth selection modules in response to user's instructions.
16. A recording/reproducing program executed by a computer, the program using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks,
- 20      the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks, a plurality of external output terminals that are capable of outputting data to at least one external device, a plurality of mixer input channels
- 25      that control characteristics of data inputted thereto and output the data, and a plurality of mixing buses that each mix data inputted thereto and output the mixed data,
- 30      the program comprising:
- 35      a first selection module that causes the data outputted from each of the tracks of the multi-track recorder to be selectively inputted to at least designated one of the mixing buses;
- a second selection module that causes the data outputted from the mixer input channels to be selectively inputted to at least designated one of the mixing buses;

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a third selection module that causes the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the external output terminals as data to be outputted therefrom;

- 5        a fourth selection module that causes the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the tracks of the multi-track recorder;

10      a display module that displays in graphical representation, concerning the mixer input channels, a first setting display showing selection settings by said second selection module for selective input of the data from the mixer input channels to the at least designated one of the mixing buses, and a second setting display

15      showing selection settings by said fourth selection module for selective input of the mixed data from each of the mixing buses to the at least designated one of the tracks of the multi-track recorder, in an manner following respective data transfer paths; and

20      a selection settings-changing module that changes the selection settings by said second selection module in response to user's instructions, and at the same time changes the first setting display displayed by said display module in graphical representation, in accordance with the changes in the selection settings by said second selection module.

17. A recording/reproducing program executed by a computer, the program using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks, a plurality of external input terminals that are capable of receiving data from at least one external device, a plurality of external output

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- terminals that are capable of outputting data to at least one external device, a plurality of mixer input channels that control characteristics of data inputted thereto and output the data, a plurality of recorder input channels  
5 that receive data from respective corresponding specific ones of the tracks of the multi-track recorder, controls characteristics of the data inputted thereto, and outputs the data, and a plurality of mixing buses that each mix data inputted thereto and output the mixed data,
- 10       the program comprising:
- a first selection module that causes the data inputted to the external input terminals to be selectively inputted to at least designated one of the mixer input channels;
- 15       a second selection module that causes the data outputted from the mixer input channels to be selectively inputted to at least designated one of the mixing buses;
- a third selection module that causes the data outputted from the plurality of recorder input channels  
20       to be selectively inputted to designated ones of the mixing buses;
- a fourth selection module that causes the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the external  
25       output terminals as data to be outputted therefrom;
- a fifth selection module that causes the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the tracks of the multi-track recorder; and
- 30       a selection settings-changing module that changes selection settings by said first to fifth selection modules in response to user's instructions.
18. A recording/reproducing program executed by a computer, the program using a multi-track digital  
35       recording/reproducing apparatus for recording and

- reproducing digital audio data by using multiple tracks,  
the apparatus including a multi-track recorder that is  
capable of performing recording and reproduction of data  
on a plurality of tracks, a plurality of external input  
5 terminals that are capable of receiving data from at  
least one external device, a plurality of mixer input  
channels that control characteristics of data inputted  
thereto and output the data, and a plurality of mixing  
buses that each mix data inputted thereto and output the  
10 mixed data,
- the program comprising:
- a first selection module that causes the data  
inputted to the external input terminals to be  
selectively inputted to at least designated one of the  
15 mixer input channels;
- a second selection module that causes the data  
outputted from each of the tracks of the multi-track  
recorder to be selectively inputted to at least  
designated one of the mixing buses;
- a third selection module that causes the data  
outputted from the mixer input channels to be selectively  
inputted to at least designated one of the mixing buses;
- a fourth selection module that causes the data  
outputted from the plurality of mixer input channels or  
25 the mixed data outputted from the mixing buses to be  
selectively inputted to at least designated one of the  
tracks of the multi-track recorder;
- a display module that displays a first setting  
display showing selection settings by said first  
30 selection module for selective input of the data inputted  
to the external input terminals to the at least  
designated one of the mixer input channels, a second  
setting display showing selection settings by said fourth  
selection module for selective input of the data from the  
35 mixer input channels to the designated least one of the

tracks of the multi-track recorder, and an execution button;

- 5        a display changing module that changes contents of the first setting display and contents of the second setting display, according to user's instructions; and
- 10      a selection settings-changing module that changes the selection settings by said first selection module based on the changed contents of the first setting display, and the selection settings by said fourth selection module based on the changed contents of the second setting display, in response to user's operation of the execution button.